
M E M O R A N D U M

Date: August 12, 2005

To: Scott Tomashefsky/Mark Rawson, California Energy Commission

Cc: Dave Michele, Edan Prabhu, Moh Vaziri, Anthony Mazy

From: Chuck Whitaker

Re: IEEE 1547 Series Meeting, August 2 - 5, Arlington VA

I attended the above meeting on behalf of the Commission. There were separate meetings for each of the active projects as shown in the agenda:

August 1 Monday

8:30 am - 5pm P1547.3 (Information Exchange)

August 2 Tuesday

8:30 am - noon P1547.3 (Information Exchange)

8:30 am - 5pm P1547.4 (DR Islanding Systems)

August 3 Wednesday

8:30 am - 3pm P1547.4 (DR Islanding Systems)

August 4 Thursday

8:30 am - 5pm P1547.2 (Guide to 1547)

8:30 am - 5pm P1547.6 (DR/Networks)

August 5 Friday

8:30 am - 3pm P1547.2 (Guide to 1547)

8:30 am - 3pm P1547.6 (DR/Networks)

For reasons of economy, I flew out on August 2 and attended the sessions on August 3-5. I attended the 1547.4 session on 8/3, 1547.6 session on 8/4 and the 1547.2 session on 8/5. Tony Mazy from the CPUC and Moh Vaziri of PG&E were also in attendance, and likely have additional perspective to add to these discussions.

Summary

Attendance was light compared to past 1547 meetings, with what seemed to be a significant utility majority and a dearth of DG manufacturers/integrators. As this meeting was more about beginnings (second meeting for .4, first meeting for .6, .5's first meeting was held at the PES meeting in San Francisco) than endings (.1 is done,

.2 and .3 are both a ways from completion), I think some people felt this was a meeting that could be missed.

It was pointed out, with some dismay, that 1547.5 (which addresses DG >10MW, connected at the transmission level) is being handled not by SCC21, but by a Power Engineering Society group. This approach implies there could be differences between .0 (1547) and .5 that might not exist had it been developed under SCC21.

1547.4 Islanding Systems. At the Las Vegas meeting in February, several people were surprised to find that the document was going to include situations where part of the area EPS would be included in the island. While it is clear that this would require a bit of process development (maybe *quite* a bit) to address liability and other concerns, the technical issues that will be addressed in the IEEE standard are more surmountable, certainly by this group.

1547.6 Network Interconnections. This was the first meeting for this document. Joe Koepfinger, IEEE Emeritus, Standards Board Member, retired from Duquesne Light Co, is the chairman, Ben Kroposki of NREL is secretary. Joe gave a quick review of the proposed outline, scope, and purpose. As discussed below in the day-by-day notes, there was an interesting discussion of the Purpose related to the idea of not degrading the quality of service.

1547.2 Application Guide. Since Moh was keeping tabs of the progress in .6, I decided to spend the last day with the .2 group. Due to parallel sessions with 1547.1, this was the first time in over a year that I had spent time with this group. I was pleasantly surprised to hear that the document is coming together and that the end of tunnel photons are measurable. The issue most topical to Rule 21 was probably certification. Chairman DeBlasio shared a presentation that NREL had prepared, in response to FERC interconnection requirements, that described a relationship between pre-certification (for equipment) and certification (for completed systems). The flowchart showed a clear order of process that included the equipment tests (type and production), system design, startup and commissioning, and final approval. While the process was very reasonable, the questions that this raised in several people's mind included why would the completed system need to be certified and who would do it. The word "certify" brings with it certain connotations—mostly liability and cost—that scare both sides away. The advantage of equipment certification (or "pre-certification" as it was called here), is that a third-party performs a defined series of tests on a sample of a device and the results can be used repeatedly by different installers at different sites and utilities. The advantage to the equipment mfg is that they only have to pay for the test one time; for the utilities the advantage is that they don't have to endlessly perform equipment type tests and someone else has assumed the responsibility for ensuring that the equipment does what they say it will do. However, at the system level, there is no carryover from one installation to the next. Each installation would have to be individually certified.

And while the utility is already willing to “approve” a system for interconnection, getting them to “certify” the installation would be a legal nightmare, at least from our discussions in Rule 21. While there needs to be discussion of these semantics issues, the overall idea presented in the flowchart is quite useful and is not in conflict with the Rule 21 certification and approval process.

See the day-by-day notes that follow for more discussion of the various documents.

Day-by-Day Notes

Aug 03 – 1547.4 Islanding

Second day of the session

As there were a number of new attendees that, like myself, were not there the previous day, Ben Kroposki started by reviewing the status of the document (reviewed the TOC). Asked for Volunteers for specific sections. Purpose and Scope (from the web page):

Scope

This document provides alternative approaches and good practices for the design, operation, and integration of distributed resource (DR) island systems with electric power systems (EPS). This includes the ability to separate from and reconnect to part of the area EPS while providing power to the islanded local EPSs. This guide includes the distributed resources, interconnection systems, and participating electric power systems.

Purpose

This guide is intended to be used by EPS designers, operators, system integrators, and equipment manufacturers. The document is intended to provide an introduction, overview and address engineering concerns of DR island systems. It is relevant to the design, operation, and integration of DR island systems. Implementation of this guide will expand the benefits of using DR by targeting improved electric power system reliability and build upon the interconnection requirements of IEEE 1547.

This document is fundamentally different from 1547 in that it considers issues beyond the PCC (both sides).

Definition of Island is slightly different in that 1547.4 discusses an island that both do and do not include a portion of the Area EPS.

Equipment must meet 1547. And then some.

Discussed what might happen if you try to create an islandable area by soliciting qualified generators, determine that those generators exist or will be installed and find that the area already has 1547-compliant DR (exporting or not), will those DR be allowed to operate in an island without additional requirements (did not come to agreement).

Are there additional testing needs that can/should be addressed in this doc?

Discussed the need for a section that covers normal EPS connected mode (1547 DOT 0 issues).

Broke up into groups. I joined the characteristics of DRs and Interconnection Systems. Tried to describe the various types of islands depending on where the

system was isolated and what it contained—e.g., a single customer, vs. a portion of a feeder vs. an entire feeder (at the sub), vs. several feeders (high side of sub transformers), etc.

Re grouped. Each group presented what was discussed.

Propose the following text:

Limitations

Does not address DR islands that include DRIS Contributors within distribution secondary spot or grid net works

Definitions

DRIS Contributor: A DR and its associated interconnection system that has met the technical and regulatory requirements to contribute to the operation of a DRIS.

DRIS Non-contributor: A DR and its associated interconnection system that has met the technical and regulatory requirements to interconnect to the Area EPS but not to contribute to the operation of the DRIS.

DR Islanding Connection Systems – the equipment and functions that facilitate the creation and reconnection of an island to an Area EPS. The DR Islanding Connection System may be a single customer-owned DR interconnection system for creating a local EPS island or Area EPS equipment for creating an island that includes a portion of the Area EPS

Aug 04 – 1547.6 Networks

Introduction from Joe Koepfinger. Went around the room and introduced ourselves—LOTS of utility folk--off the top of my head: Con Ed, N-Grid, N-Star, TU, Alabama Power, DTE, Com Ed, but only Moh from the west coast. Only two or three DG suppliers, at least that many from relay manufacturers.

Reviewed the document scope and purpose. (Below from the web page)

Scope

This standard builds upon IEEE Standard 1547 for the interconnection of distributed resources (DR) to distribution secondary network systems. This standard establishes recommended criteria, requirements and tests, and provides guidance for interconnection of distribution secondary network system types of area electric power systems (Area EPS) with distributed resources (DR) providing electric power generation in local electric power systems (Local EPS).

Purpose

This standard focuses on the technical issues associated with the interconnection of Area EPS distribution secondary networks with a Local EPS having DR generation. The standard provides recommendations relevant to the performance, operation, testing, safety considerations, and maintenance of the interconnection. In this standard consideration is given to the needs of the Local EPS to be able to provide enhanced service to the DR owner loads as well as to other loads served by the network. Equally, the standard addresses the technical concerns and issues of the Area EPS. Further, this standard identifies communication and control recommendations and provides guidance on considerations that will have to be addressed for such DR interconnections.

Wordsmithed a bit. Joe was not happy with the third sentence of the purpose (“In this standard consideration is given to the needs of the Local EPS to be able to provide enhanced service to the DR owner loads as well as to other loads served by the network.”). On the one hand, it’s not clear what this sentence really says—I think many people initial read “needs of the *Area EPS*” rather than “*Local EPS*”. After several reads, I take it to mean that the standard address the desire of the Network Customer to install DR at their facility (to enhance their service). That seems to fit with the subsequent sentence about addressing the Area EPS concerns and issues. However, several people focused on the “enhanced service” phrase and decided they wanted to include the notion that the addition of the DG should not degrade the service in the network. I thought that 1) this issue was addressed in the subsequent sentence and 2) placing requirements was inappropriate in a scope. The group felt otherwise. Several versions of optional text, I didn’t record which one was voted through.

Reviewed Joe’s proposed outline. Asked me to take a crack at a section that will map 1547 requirements. I assume that means to summarize 1547 and suggest how each requirement applies in a spot or area network. I figure I will tabularize a summary of 1547 requirements and note in Spot and Area columns how the requirements affect each.

Other groups looked at planning, protection other issues.

Discussed the work we are doing in Rule 21 and suggested that folks take a look at the Rule 21 web page.

Aug 05 – 1547.2 Application Guide

Group had met yesterday so this was a continuation.

Looked over DC injection Opened my mouth and was asked to prepare a discussion of why 0.5% dc injection limit may be a conservative value . Due Oct 19 to Friedman and Saint.

- 0.5% assumes that installed DG capacity = transformer capacity
- 0.5% assumes no diversity (i.e. that when aggregated, all DG are providing dc of the same sign

Flicker section - Bob Saint says that IEEE has adopted the IEC flicker requirements in IEEE 1453.

Reviewed Testing section—seems to be an appropriate level of overview.

New Section 10 Information requirements. Presents a lot of the process and tariff related issues in way more detail than is probably appropriate.

Charles Rogers will re rewrite this section to cover information DR needs to provide to Area EPS, info Area EPS needs to provide to DR, and other info from the Area EPS/regulators

Appendices:

A. What should go in the biblio?

B. What's the difference between glossary and definitions?

C. Examples: Supposed to contain examples (drawings) of different interconnections such as those in the NRECA document.

D. System Impacts

Or engineering studies or interconnection study or feasibility, or...

Basic system impact study followed by detailed facility or interconnection review / study.

Suggestion was made to include system impacts in to section 10, information requirements.

I suggested that the group take a look at the Rule 21 Supplemental Review Guideline

Certification

DeBlasio provided a NREL-prepared slide showing a certification/pre-certification process where Pre cert applies to the equipment, Cert applies to the completed system (post commissioning test). Was prepared in response to otherwise undefined FERC pre-certification requirement. This actually came from the Texas Interconnection requirements, which specify a pre-certification that is similar to our certification process (I had argued in the Texas proceedings, obviously unsuccessfully, that the "pre" distinction was unnecessary and confusing—was a bit more successful in California!). Discussed the idea that the installed system needs to be, should be, or even CAN be "certified".